

Birds of Ambondrolava mangrove complex, southwest Madagascar

Charlie J. Gardner^{1,2*}, Carola De Ridder³, Benjamin De Ridder³ and Louise D. Jasper⁴

¹ University of Kent, Durrell Institute of Conservation and Ecology, Canterbury CT2 7NS, UK.

² WWF Madagascar and Western Indian Ocean Programme Office, B.P. 738, Antananarivo 101, Madagascar.

³ Honko Mangrove Conservation & Education vzw, Kastanjedreef 1, 2900 Schoten, Belgium.

⁴ B.P. 639, Toliara 601, Madagascar.

* Corresponding author. E-mail: cjamgardner@yahoo.co.uk

ABSTRACT: Here we present the first bird species list for Ambondrolava (23°15'41" S, 43°37'42" E), a mangrove and freshwater wetland complex in dry southwest Madagascar. Sixty-nine species from 36 families were recorded, of which 14 species are endemic to Madagascar and 13 are endemic to the Madagascar region. Two globally threatened species were recorded: *Charadrius thoracicus* (Vulnerable) and *Circus macroscleus* (Vulnerable). With 36 species, Ambondrolava has the highest known wetland bird species diversity of any site in south and southwest Madagascar.

INTRODUCTION

With 284 species Madagascar has a relatively species-poor avifauna, but 109 species are endemic and a further 26 are restricted to the Madagascar region (including the Comoros, Mascarene and Seychelles island groups), giving it the highest percentage endemism of any comparable landmass in the world (Goodman and Hawkins 2008). Although recognized as an Endemic Bird Area (EBA) on the basis of ten locally-endemic species (Stattersfield *et al.* 1998), few published bird inventories exist for the south and southwest of the country. This sub-arid region is dominated by xerophytic spiny forests and thickets and receives a mean annual rainfall of 386 mm at Toliara (Dewar and Richard 2007); it consequently possesses few wetland areas (Figure 1), and many of the wetland bird species characteristic of western Madagascar are thought to be rare or absent south of the major Lac Ihotry/Mangoky delta wetland complex (Langrand 1990). Further, little is known about the utilization of mangroves by Madagascar's birds. Here we present the first bird inventory of Ambondrolava, a mangrove, freshwater wetland and salt pan complex in southwest Madagascar, and discuss the conservation importance of its avifauna.

MATERIALS AND METHODS

Study site

Ambondrolava (23°15'41" S, 43°37'42" E) lies between the Route Nationale 9 (to the east) and dunes bordering the Mozambique Channel (to the west), 10 km north of the regional capital of Toliara. With a total area of approximately 660 ha, it comprises four main habitats:

1) secondary mangrove forest composed of *Avicennia marina* (Forssk.) Vierh., *Bruguiera gymnorhiza* (L.) Lamk., *Ceriops tagal* (Perr.) C.B. Rob., *Rhizophora mucronata* Lam., *Sonneratia alba* Sm., and *Xylocarpus granatum* J. Koenig. (Figure 2);

2) freshwater marshes dominated by *Typha angustifolia* L., *Phragmites mauritianus* Kunth, and the fern *Acrostichum*

aureum L.;

3) open mudflats and former commercial salt pans that are now abandoned and flooded, both converted from mangroves;

4) areas of highly-degraded scrub that have replaced the original spiny thicket vegetation surrounding the wetland. A distance of several hundred metres now separates the complex from the nearest forest cover, itself highly degraded and dominated by *Didierea madagascariensis* Baill.

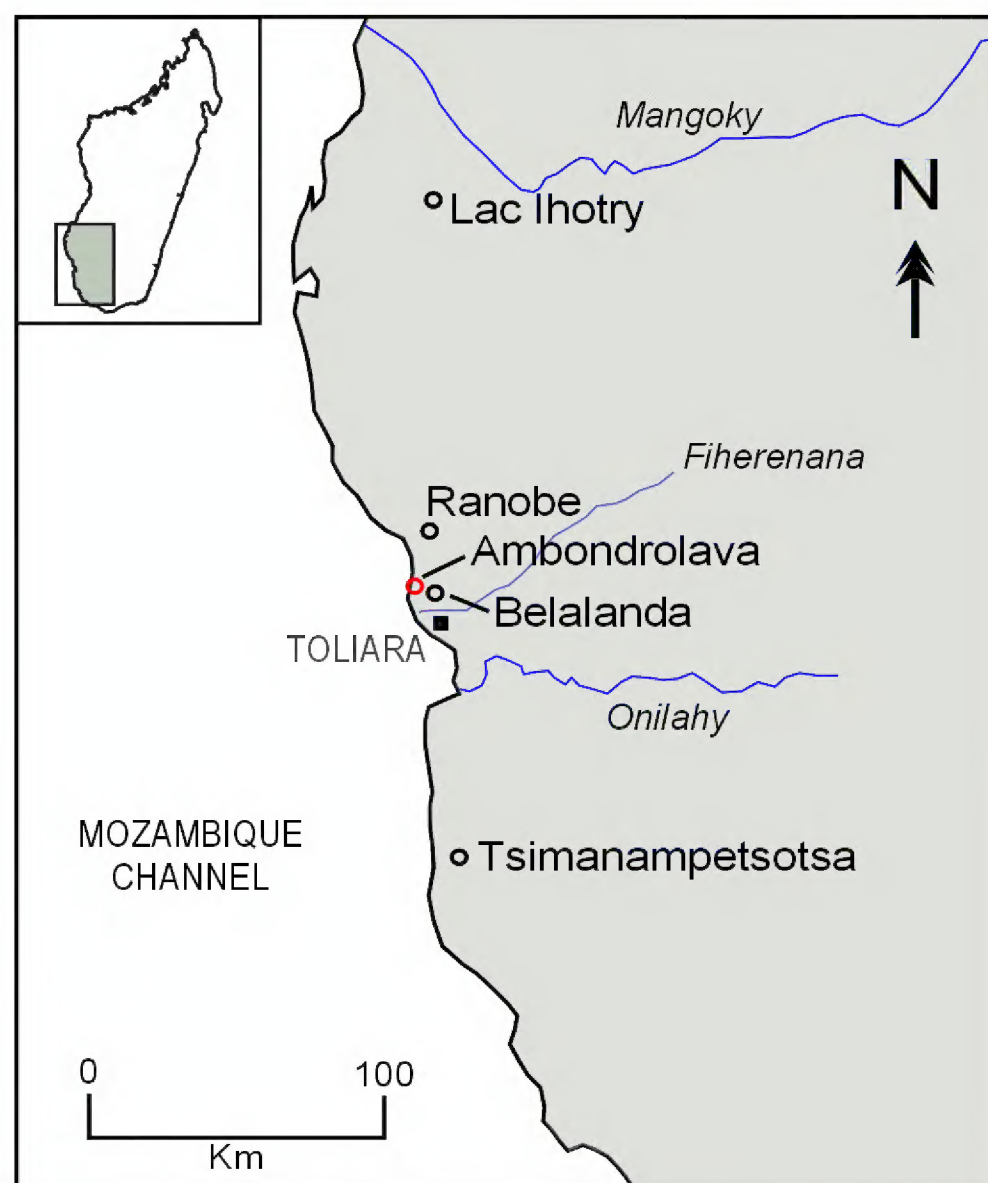


FIGURE 1. Map of southwest Madagascar showing location of Ambondrolava and other wetlands mentioned in text.

The site is managed by the local community association Mamelo Honko under the terms of a management transfer contract with the state (GELOSE, see Antona *et al.* 2004), with technical support from the mangrove conservation NGO Honko.



FIGURE 2. Typical habitat at Ambondrolava, with reed beds in the foreground and mangroves, dominated by *Avicennia marina*, in the background.

Data collection

No formal methods were used to inventory birds at the site; the list is instead based on casual observations made by the authors in all habitats between 2008 and 2011. During this period CDR and BDR were resident on site, while CJG and LDJ visited the complex on an approximately monthly basis. Data cited here on species distributions within southern Madagascar are based on a literature review of modern records, including Goodman *et al.* (1997), Goodman *et al.* (2002), Raheirilalao and Wilmé (2008) and Gardner *et al.* (2009), as well as records contained within the field guides Langrand (1990) and Morris and Hawkins (1998).

RESULTS AND DISCUSSION

We recorded 69 bird species of which 14 are endemic to Madagascar and a further 13 are endemic to the Madagascar region (Table 1); a selection of these species is illustrated in Figures 3 and 4. One species, *Nesillas lantzii* (Grandidier 1867) is endemic to the South Malagasy spiny forest EBA (Stattersfield *et al.* 1998), and two species are globally threatened (IUCN 2011): *Charadrius thoracicus* (Richmond 1896) (Vulnerable) and *Circus macroscyles* Newton 1863 (Vulnerable). The 69 species were distributed within 36 families, the best represented families being Ardeidae (nine species), Charadriidae (seven species), and Scolopacidae (five species).

Particularly noteworthy records are presented below:

Anhinga melanogaster Pennant, 1769 – We recorded this species once, flying north over the main channel of the mangroves on 21 January 2011. *A. melanogaster* has not been previously recorded at Ranobe or Belalanda (Gardner *et al.* 2009), and we are aware of records from only two other sites in southern Madagascar; Lac Ihotry (Rand 1936), and Tuléar (no precise locality given) (Bangs 1918).

Ixobrychus minutus (Linnaeus, 1766) – Rare in southern Madagascar and previously recorded only from Lac Ihotry (Rand 1936), Ranobe, and Belalanda (Gardner *et al.* 2009). Regularly observed during the austral summer,

but may be present all year; breeding is suspected based on the presence of two juveniles on 26 December 2010.

Circus macroscyles A. Newton, 1863 – This globally Vulnerable (IUCN 2011) endemic to the Madagascar region has an estimated global population size of 250-500 pairs, restricted in Madagascar to marshes and grassland in the centre and north-west of the island (René de Roland *et al.* 2009). We observed a pair in courtship - pair-formation flights as described by René de Roland *et al.* (2004) - during August 2010 and September 2011, but breeding was not confirmed. We are not aware of other reports of possible breeding activity in southern Madagascar, although little is known of the breeding biology of this species (René de Roland *et al.* 2004; 2009)

Porphyryla alleni (Thomson, 1842) – This species has not previously been recorded at Ranobe or Belalanda (Gardner *et al.* 2009), and we are aware of only one additional record from southern Madagascar – at Lac Hera near Sakaraha (Rakotonomenjanahary and Rabenandrasana 1999). Calls were infrequently recorded from the reed beds during October and November 2009.

Charadrius thoracicus (Richmond, 1896) – A Vulnerable (IUCN 2011) endemic to western Madagascar, the global population of this species is estimated at approximately 3000 individuals (Long *et al.* 2008) and is thought to be rapidly declining as a result of poor reproductive success (Zefania *et al.* 2008). We recorded a single bird in short grass at the edge of the Ambondrolava reed beds on 5 December 2008.

Hirundo rustica Linnaeus, 1758 – A regular migrant to southwest Madagascar known to roost in reed beds at Ranobe, 26 km to the north of Ambondrolava (Gardner and Jasper 2011). This species was infrequently observed foraging over the reed beds between January and April in all years.

Classifying Ambondrolava's avifauna in terms of primary habitat use (based on Wilmé 1996; Goodman and Hawkins 2008), we recorded 36 wetland species, 18 predominantly forest species, and 15 species characteristic of open or degraded areas. This represents the highest known diversity of wetland birds of any site in southern Madagascar south of the Lac Ihotry/Mangoky delta complex, compared to Ranobe (32), Belalanda (28), and Tsimanampetsotsa (15) (Goodman *et al.* 2002; Gardner *et al.* 2009). This high wetland bird diversity is not simply the result of the coastal location of the site and the existence of mudflats and saltpans which attract waders (Charadriidae and Scolopacidae), since only three of these species were not recorded at any of the inland sites: *Arenaria interpres* (Linnaeus, 1758), *Charadrius leschenaultii* Lesson, 1826, and *Numenius phaeopus* (Linnaeus, 1758). The mangrove forest itself harboured relatively low bird diversity, with only 31 species (including 11 wetland species) observed to use this habitat.

Our observations demonstrate that the mangroves of southwest Madagascar are of less importance for bird conservation than the extensive mangrove forests of the west and northwest of the island, which provide important strongholds for four Red List (IUCN 2011) endemic species: *Anas bernieri* (Hartlaub, 1860) (Endangered); *Threskiornis bernieri* (Bonaparte, 1855) (Endangered); *Haliaeetus*

vociferoides Des Murs, 1845 (Critically Endangered), and *Ardea humbloti* Milne-Edwards and Grandidier, 1885 (Endangered). Although *A. humbloti* is regularly observed on the coast to the north and south of Ambondrolava, we

have never observed it at the site. Despite the lack of such nationally important species, the bird diversity that we observed at the site demonstrates its regional importance for wetland bird conservation.



FIGURE 3. Representative bird species from Ambondrolava. A – striated heron, *Butorides striatus*; B – great egret, *Ardea alba*; C – hamerkop, *Scopus umbretta*; D – Madagascar harrier, *Circus macroscyles*; E – Madagascar buttonquail, *Turnix nigricollis* (female); F – white-throated rail, *Dryolimnas cuvieri*; G – purple swampphen, *Porphyrio porphyrio* (individual trapped for food by villagers); H – greater painted snipe, *Rostratula benghalensis* (female).

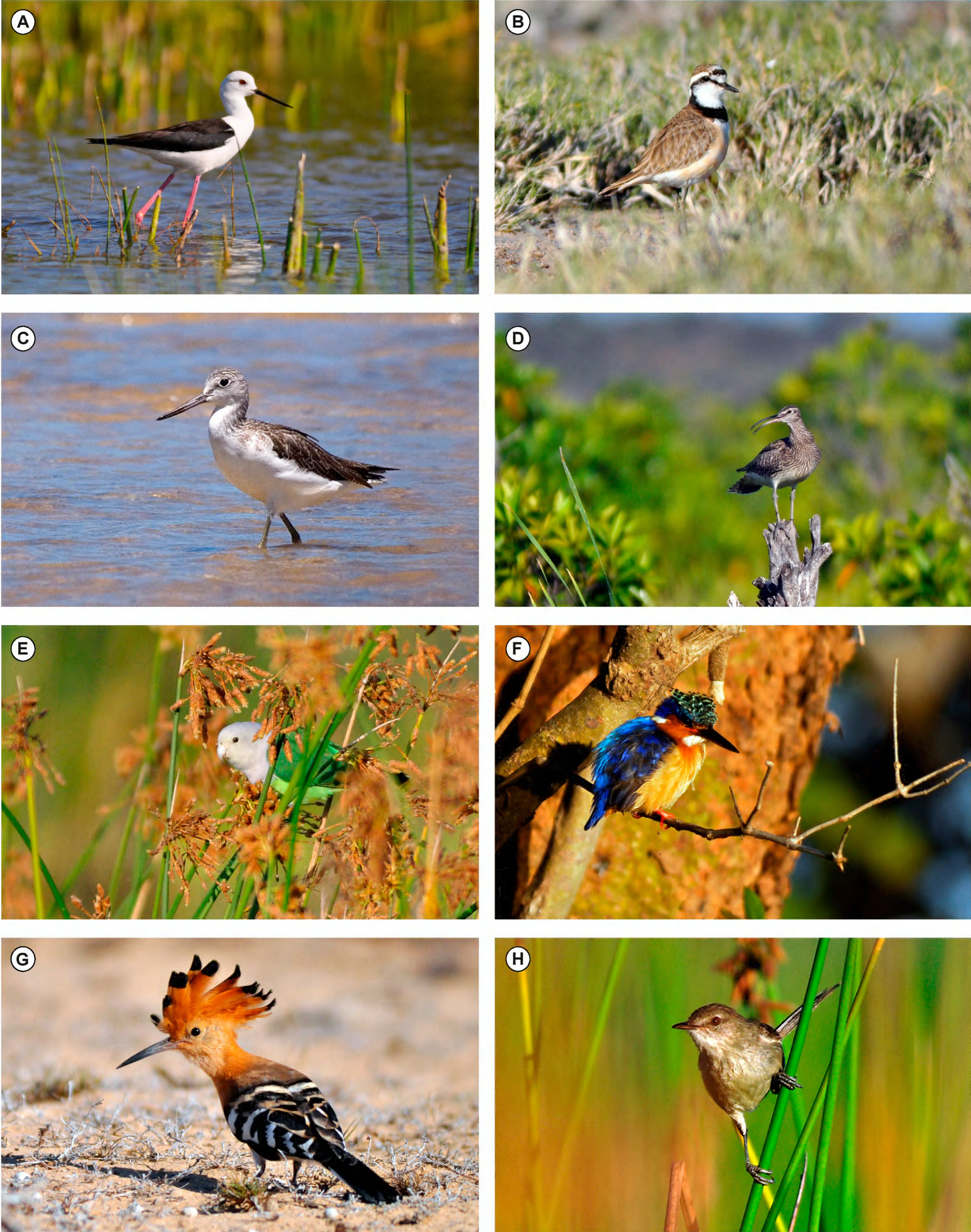


FIGURE 4. Representative bird species from Ambondrolava. A – black-winged stilt, *Himantopus himantopus*; B – Madagascar plover, *Charadrius thoracicus*; C – common greenshank, *Tringa nebularia*; D – whimbrel, *Numenius phaeopus*; E – grey-headed lovebird, *Agapornis cana* (male); F – Madagascar malachite kingfisher, *Alcedo vintsioides*; G – Madagascar hoopoe, *Upupa marginata*; H – Madagascar swamp-warbler, *Acrocephalus newtoni*.

TABLE 1. List of bird species recorded at Ambondrolava from 2008-2011. Status: RE – endemic to Madagascar region; ME – Madagascar endemic; SE – endemic to southern Madagascar; I – introduced. Habitat use: M – mangrove; R – reed bed and freshwater wetland; MS – mudflat and salt pan; S – scrub; O – open areas; F – Species observed only in flight, and thus not using any habitat. Number of species in each family is given in brackets. English names follow Hawkins and Goodman (2003).

FAMILY/SCIENTIFIC NAME	ENGLISH NAME	STATUS	HABITAT USE
PODICIPEDIDAE (1)			
<i>Tachybaptus ruficollis</i> (Pallas,1764)	little grebe		R
ANHIGIDAE (1)			
<i>Anhinga melanogaster</i> Pennant, 1769	darther		F
ARDEIDAE (9)			
<i>Ixobrychus minutus</i> (Linnaeus, 1766)	little bittern		R
<i>Nycticorax nycticorax</i> (Linnaeus, 1758)	black-crowned night heron		M
<i>Ardeola ralloides</i> (Scopoli, 1769)	squacco heron		R
<i>Bubulcus ibis</i> (Linnaeus, 1758)	cattle egret		O, MS, M
<i>Butorides striatus</i> (Linnaeus, 1758)	striated heron		M, R, MS
<i>Egretta ardesiaca</i> (Wagler, 1827)	black egret		MS
<i>Egretta dimorpha</i> Hartert, 1924	dimorphic egret		MS, M
<i>Ardea alba</i> (Linnaeus, 1758)	great egret		M, R, MS
<i>Ardea cinerea</i> Linnaeus, 1758	grey heron		M, R, MS
SCOPIDAE (1)			
<i>Scopus umbretta</i> Gmelin, 1789	hamerkop		R
PHOENICOPTERIDAE (1)			
<i>Phoenicopterus ruber</i> Linnaeus, 1758	greater flamingo		F
ANATIDAE (3)			
<i>Dendrocygna viduata</i> (Linnaeus, 1766)	white-faced whistling duck		F
<i>Anas erythrorhynca</i> Gmelin, 1789	red-billed teal		M
<i>Anas hottentota</i> (Eyton, 1838)	Hottentot teal		R, MS
ACCIPITRIDAE (3)			
<i>Milvus aegyptius</i> (Gmelin 1788)	yellow-billed kite		F, R, M
<i>Polyboroides radiatus</i> (Scopoli 1786)	Madagascar harrier-hawk	ME	F, M
<i>Circus macrosceles</i> A. Newton 1863	Madagascar harrier	RE	R
FALCONIDAE (2)			
<i>Falco newtoni</i> (Gurney, 1863)	Madagascar kestrel	RE	S, M
<i>Falco concolor</i> Temminck, 1825	sooty falcon		F
TURNICIDAE (1)			
<i>Turnix nigricollis</i> (Gmelin, 1789)	Madagascar buttonquail	ME	S
RALLIDAE (3)			
<i>Dryolimnas cuvieri</i> (Pucheran, 1845)	white-throated rail		M, R
<i>Porphyryla alleni</i> (Thomson, 1842)	Allen’s gallinule		R
<i>Porphyrio porphyrio</i> (Linnaeus, 1758)	purple swampphen		R
ROSTRATULIDAE (1)			
<i>Rostratula benghalensis</i> (Linnaeus, 1758)	greater painted snipe		R
RECUVIROSTRIDAE (1)			
<i>Himantopus himantopus</i> (Linnaeus, 1758)	black-winged stilt		MS
CHARADRIIDAE (7)			
<i>Pluvialis squatarola</i> (Linnaeus, 1758)	grey plover		MS
<i>Charadrius hiaticula</i> Linnaeus, 1758	ringed plover		MS
<i>Charadrius thoracicus</i> (Richmond, 1896)	Madagascar plover	ME	O
<i>Charadrius pecuarius</i> Temminck, 1823	Kittlitz’s plover		MS, O
<i>Charadrius marginatus</i> Vieillot, 1818	white-fronted plover		MS
<i>Charadrius tricollaris</i> Vieillot, 1818	three-banded plover		MS
<i>Charadrius leschenaultii</i> Lesson, 1826	greater sandplover		MS
SCOLOPACIDAE (5)			
<i>Arenaria interpres</i> (Linnaeus, 1758)	ruddy turnstone		MS
<i>Tringa nebularia</i> (Gunnerus, 1767)	common greenshank		R, MS
<i>Actitis hypoleucos</i> (Linnaeus, 1758)	common sandpiper		MS
<i>Calidris ferruginea</i> (Pontoppidan, 1763)	curlew sandpiper		R, MS
<i>Numenius phaeopus</i> (Linnaeus, 1758)	whimbrel		R, M, MS
COLUMBIDAE (2)			
<i>Streptopelia picturata</i> (Temminck, 1813)	Madagascar turtle dove	RE	M, R
<i>Oena capensis</i> (Linnaeus, 1766)	Namaqua dove		S, O
PSITTACIDAE (1)			
<i>Agapornis cana</i> (Gmelin, 1788)	grey-headed lovebird	ME	M, R, S

TABLE 1. CONTINUED.

FAMILY/SCIENTIFIC NAME	ENGLISH NAME	STATUS	HABITAT USE
CUCULIDAE (2)			
<i>Cuculus rochii</i> Hartlaub, 1862	Madagascar lesser cuckoo		M
<i>Centropus toulou</i> (Müller, 1776)	Madagascar coucal	RE	M, R, S
CAPRIMULGIDAE (1)			
<i>Caprimulgus madagascariensis</i> Sganzin, 1840	Madagascar nightjar	RE	S
APODIDAE (2)			
<i>Apus melba</i> (Linnaeus, 1758)	alpine swift		F
<i>Apus barbatus</i> (Sclater, 1865)	African black swift		F
ALCEDINIDAE (1)			
<i>Alcedo vintsioides</i> Eydoux and Gervais, 1836	Madagascar malachite kingfisher	RE	M, R
MEROPIDAE (1)			
<i>Merops superciliosus</i> Linnaeus, 1766	Madagascar bee-eater		M, R, S
UPUPIDAE (1)			
<i>Upupa marginata</i> (Cabanis and Heine, 1860)	Madagascar hoopoe	ME	S, R
ALAUDIDAE (1)			
<i>Mirafra hova</i> Hartlaub, 1860	Madagascar lark	ME	S, O
HIRUNDINIDAE (2)			
<i>Phedina borbonica</i> (Gmelin 1789)	Mascarene martin	RE	R, F
<i>Hirundo rustica</i> Linnaeus, 1758	barn swallow		R, F
PYCNONOTIDAE (1)			
<i>Hypsipetes madagascariensis</i> (Müller, 1776)	Madagascar bulbul	RE	M
MUSCICAPIDAE (1)			
<i>Copsychus albospectularis</i> (Eydoux and Gervais, 1836)	Madagascar magpie-robin	ME	M, S
SYLVIIDAE (3)			
<i>Acrocephalus newtoni</i> (Hartlaub, 1863)	Madagascar swamp-warbler	ME	M, R
<i>Nesillas lantzii</i> (Grandidier, 1867)	subdesert brush warbler	SE	S
<i>Neomixis tenella</i> (Hartlaub, 1866)	common jery	ME	S, M
CISTICOLIDAE (1)			
<i>Cisticola cherina</i> (Smith, 1843)	Madagascar cisticola	RE	R, S, M
MONARCHIDAE (1)			
<i>Terpsiphone mutata</i> (Linnaeus, 1766)	Madagascar paradise flycatcher	RE	M
NECTARINIIDAE (2)			
<i>Nectarinia notata</i> (Müller 1766)	Madagascar green sunbird	RE	M
<i>Nectarinia souimanga</i> (Gmelin, 1788)	souimanga sunbird	RE	S, M
VANGIDAE (1)			
<i>Leptopterus chabert</i> (Müller, 1776)	Chabert’s vanga	ME	M
CICRURIDAE (1)			
<i>Dicrurus forficatus</i> (Linnaeus, 1766)	crested drongo	RE	M, R, S
CORVIDAE (1)			
<i>Corvus albus</i> Müller, 1776	pied crow		M, S, O
STURNIDAE (1)			
<i>Acridotheres tristis</i> (Linnaeus, 1766)	common myna	I	M, S, O
PLOCEIDAE (2)			
<i>Ploceus sakalava</i> Hartlaub, 1861	Sakalava weaver	ME	S
<i>Foudia madagascariensis</i> (Linnaeus, 1766)	Madagascar red fody	ME	S, R, M
ESTRILDIDAE (1)			
<i>Lonchura nana</i> (Pucheran, 1845)	Madagascar mannikin	ME	R, S

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